5th Strategic Energy Forum

A CO_2-lean energy society by 2050

transition & business opportunities

HOGESCHOOL GENT
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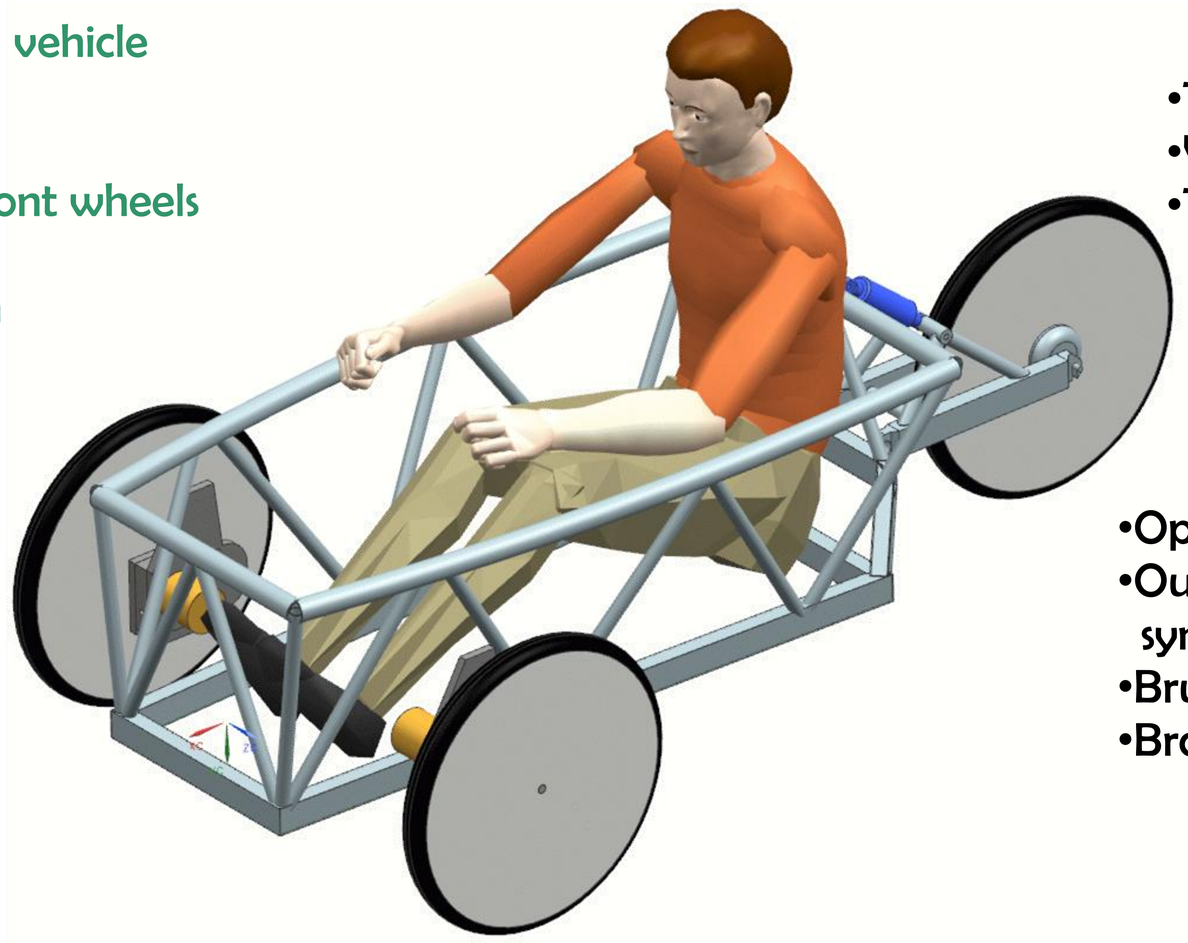
SET
SUSTAINABLE ENERGY TECHNOLOGIES

Ecological Low Budget Electric Vehicle

University College Ghent, Ghent University

- Electrically driven one person vehicle
- Tricycle
  - One rear wheel
  - Two driven and steering front wheels
- Weight ± 100 kg
- Maximum speed 70-80 km/h

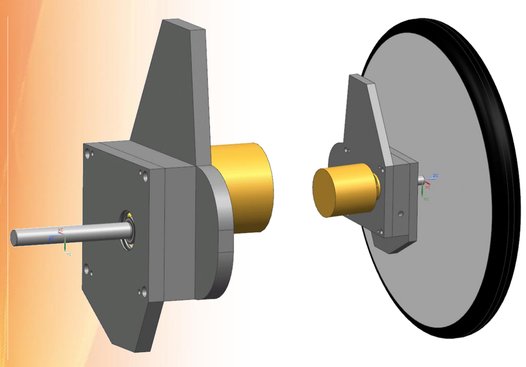


Dimensions ELBEV

- Total length 2200 mm
- Width 1200 mm
- Total height 1200 mm

2-stage gearbox

- Transmission ratio 1:7

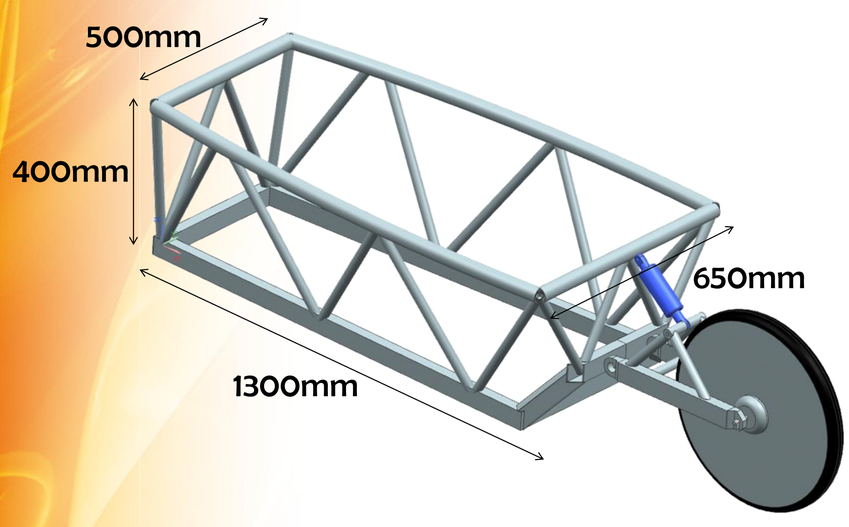


Drive train

- Optimized for high efficiency
- Outer rotor permanent magnet synchronous motor
- Brushless DC
- Brake energy recuperation

Design of chassis and rear suspension

- Aluminium 6060T6
- Round tubes and rectangular tubes
- Total weight 9,8 kg



Lighting

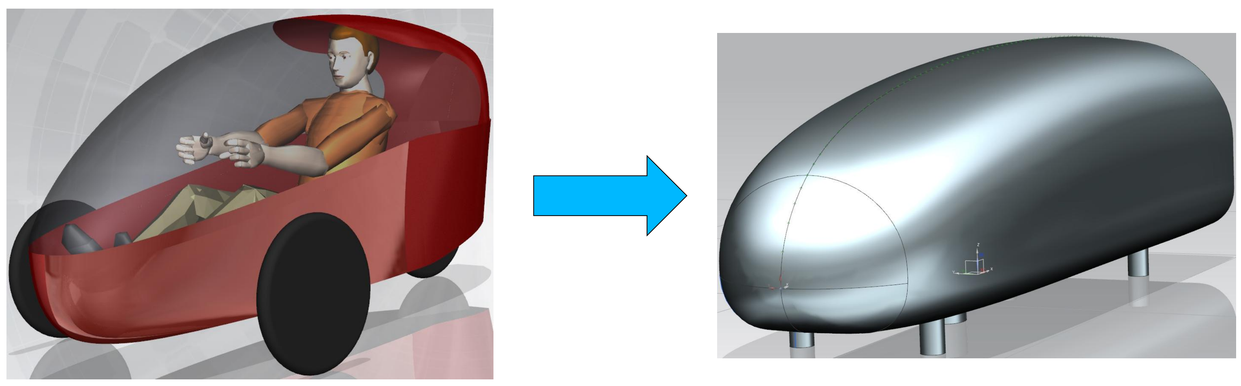
- LED's
- Flyback convertor
  DC current in the LED's is controlled via current feedback

Steering wheel

- Contactless brake and throttle control

Aerodynamic optimisation

- Most significant driving speed
- Validation case with Fluent
  - Simplified car model
  - Airspeed 48 km/h
  - Reynolds number 2.000.000

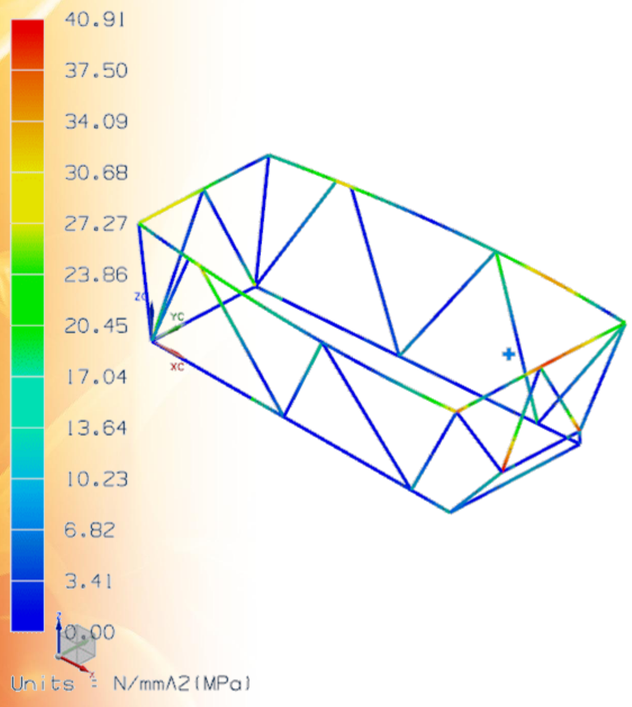


Realistic car model

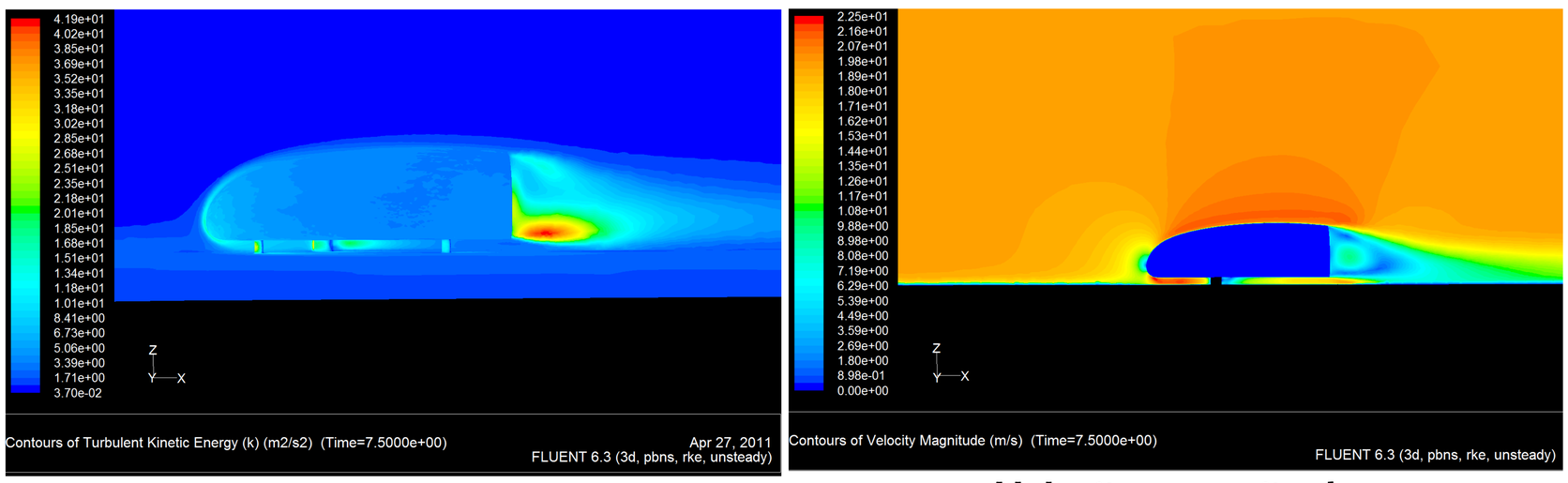
Simplified car model

Analysis of mechanical stresses

- Finite element analysis with NX Nastran



Von-Mises stress



Turbulent kinetic energy

Velocity magnitude

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VBO Verbond van Belgische Ondernemingen | FEB Fédération des Entreprises de Belgique

Comité des Ingénieurs Belges - Belgisch IngenieursComité

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